

Remarks

Claims 21-36 have been rejected under 35 U.S.C. §102(b) as being anticipated by Miller (US 2003/0092994).

The above-mentioned rejection is respectfully traversed for the following reasons.

Initially, it is noted that the rejection states that the language “wherein, when the parallel reception is performed …” is not entitled to patentable weight because the language is directed to the intended use of the apparatus. However, as is readily apparent from, for example, claim 1, the language “when the parallel reception is performed with linear scanning, the controller controls delay times …” (emphasis added) describes the operation of the controller. This language does not relate in any way to an intended use of the controller or the ultrasonic diagnostic apparatus. As a result, such a position is improper and this limitation is entitled to patentable weight.

In light of the above, claim 21 is patentable over Miller, since claim 21 recites an ultrasonic diagnostic apparatus including, in part, a controller such that when parallel reception is performed by the ultrasonic diagnostic apparatus, the controller controls delay times corresponding to respective elements of an array of elements to meander a movement track of focus points in reception dynamic focusing in relation to transmission focus positions so that a composite beam of a received beam and a transmitted beam is substantially shaped as a straight line. Miller fails to disclose or suggest this feature of claim 21.

Miller discloses an ultrasonic probe having a transducer array 42 including a number of sub-arrays 43 and 44, and a control processor 140. The control processor 140 is capable of providing delay commands to both transmit beamformer channels 215 of a transmit beamformer 200A and receive beamformer channels 225 of a parallel receive beamformer 200B. (See page 7, paragraphs [0080] and [0083]-[0087], and Figure 5B).

Based on the above discussion, when parallel reception is performed with sector scanning (i.e., not with linear scanning) in the ultrasonic probe of Miller, the control processor 140 provides delay commands to the receive beamformer channels 225 of the parallel receive beamformer 200B to shape the received beams as straight lines that are not parallel to the transmitted beam. This disclosure in Miller that the operation of the control processor 140 is such that the received beams are shaped as straight lines that are not parallel to the transmitted beam, when parallel reception is performed with sector scanning, is completely different that the

operation of the claimed controller which addresses a problem associated with the meandering of composite beams of the transmitted beam and the received beams. That is, there is no disclosure or suggestion in Miller that, when parallel reception is performed, the control processor 140 provides the delay commands in reception dynamic focusing so that a composite beam of a received beam and a transmitted beam is substantially shaped as a straight line. As a result, claim 21 is patentable over Miller.

Further, claims 25, 29 and 33 are patentable over Miller for reasons similar to those set forth above with regard to claim 21. That is, claims 25, 29 and 33 each recite, in part, a controller that, when parallel reception is performed, controls delay times corresponding to respective elements of an array of elements in reception dynamic focusing so that a composite beam of a received beam and a transmitted beam is substantially shaped as a straight line at least in certain areas, which feature is not disclosed or suggested by Miller.

Claim 23 is also patentable over Miller, since claim 23 recites an ultrasonic diagnostic apparatus including, in part, a controller such that when parallel reception is performed by the ultrasonic diagnostic apparatus, the controller controls one of (i) gains of a receiving circuit, the gains corresponding to respective elements of an array of elements and (ii) the gains of the receiving circuit and delay times corresponding to the respective elements of the array of elements, to meander a movement track of focus points in reception dynamic focusing in relation to transmission focus positions so that a composite beam of a received beam and a transmitted beam is substantially shaped as a straight line. Miller fails to disclose or suggest this feature of claim 23.

Miller also discloses that each of the receive beamformer channels 225 includes a variable gain amplifier that controls gain as a function of received signal depth. (See page 7, paragraph [0087]). However, as discussed above, there is no disclosure or suggestion in Miller that the control processor 140 controls one of (i) gains of a receiving circuit, the gains corresponding to respective elements of an array of elements and (ii) the gains of the receiving circuit and delay times corresponding to the respective elements of the array of elements, so that a composite beam of a received beam and a transmitted beam is substantially shaped as a straight line. As a result, claim 23 is patentable over Miller.

Further, it is noted that claims 27, 31 and 35 are patentable over Miller for reasons similar to those set forth above with regard to claim 23. That is, claims 27, 31 and 35 each recite, in

part, a controller that, when parallel reception is performed, controls one of (i) gains of a receiving circuit, the gains corresponding to respective elements of an array of elements and (ii) the gains of the receiving circuit and delay times corresponding to the respective elements of the array of elements, in reception dynamic focusing so that a composite beam of a received beam and a transmitted beam is substantially shaped as a straight line at least in certain areas, which feature is not disclosed or suggested by Miller.

Claims 29-36 have also been rejected under 35 U.S.C. §103(a) as being obvious over Miller in view of Banta, Jr. (US 6,055,861).

As for Banta, Jr., it is relied upon as disclosing the use of both a linear scan pattern 14 and sector scan patterns 16 and 18 in a composite scan pattern 12. (See column 4, lines 34-48). However, it is clear that Banta, Jr. also fails to disclose or suggest the above-discussed features of the controller recited in claims 29, 31, 33 and 35. As a result, claims 29, 31, 33 and 35 are patentable over the combination of Miller and Banta, Jr.

Because of the above-mentioned distinctions, it is believed clear that claims 21-36 are allowable over the references relied upon in the rejections. Furthermore, it is submitted that the distinctions are such that a person having ordinary skill in the art at the time of invention would not have been motivated to make any combination of the references of record in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 21-36. Therefore, it is submitted that claims 21-36 are clearly allowable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that there are issues remaining which must be resolved before allowance of the application.

Respectfully submitted,

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